

8

Notice of Allowability

Application No.

10/620,698

Examiner

Andy Huynh

Applicant(s)

WATANABE ET AL.

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment dated 12/22/2004.
2. ☒ The allowed claim(s) is/are 1, 2, 4-12 and 16-32.
3. ☒ The drawings filed on 22 December 2004 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____ 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
|---|---|

Andy Huynh
 Patent Examiner
 TC 2800

DETAILED ACTION

In the Amendment dated December 22, 2004, Figs. 21-22 of the drawings are amended, claims **3 and 13-15** are canceled, claims **1, 10, 12, 16 and 17** are amended, and new claims 27-32 are added. Accordingly, claims **1-2, 4-12 and 16-32** are currently pending in this application.

Examiner's Amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In claim **16**, "The device according to claim 14" is changed to – The device according to claim 12--, due to claim **14** is canceled.

In claim **17**, line 12, "... a ate insulating film ..." is changed to –... a gate insulating film ...--, and in claim **28**, line 3, "first ate" is changed to –first gate--.

Allowable Subject Matter

Claims **1-2, 4-12 and 16-32** are allowed.

The following is an examiner's statement of reason for allowance:

Claims **1, 2, 4-9 and 31** are allowable over the prior art of record because the prior art of record does not teach or render obvious a semiconductor device comprises, in combination with all other features, a first lower electrode provided on the second impurity diffusion area, and in

Art Unit: 2818

addition, a first contact plug partly provided in the first trench and electrically connecting the first interconnection layer and the first impurity diffusion area as recited in independent claim 1.

Claims **10 and 11** are allowable over the prior art of record because the prior art of record does not teach or render obvious a semiconductor device comprises, in combination with all other features, a first lower electrode provided on the second impurity diffusion area, and in addition, a first insulating film covering the first gate electrode and a second insulating film which is buried in the first trench and different from the first insulating film as recited in independent claim 10.

Claims **12, 16 and 32** are allowable over the prior art of record because the prior art of record does not teach or render obvious a semiconductor memory device comprises, in combination with all other features, each capacitor comprising a lower electrode provided on the second impurity diffusion area, and in addition, each of the plurality of first contact plugs is partly provided in one of the plurality of trenches and electrically connects one of the plurality of the interconnection layers and the first impurity diffusion area as recited in independent claim 12.

Claims **17, 18 and 30** are allowable over the prior art of record because the prior art of record does not teach or render obvious a semiconductor device comprises, in combination with all other features, a first lower electrode provided on the second impurity diffusion area, and in addition, a first insulating film covering the first gate electrode and a second insulating film which is buried in the first trench and different from the first insulating film as recited in independent claim 17.

Art Unit: 2818

Claims **19-22** are allowable over the prior art of record because the prior art of record does not teach or render obvious a method of manufacturing a semiconductor memory device comprises, in combination with all other features, forming a lower electrode on the second impurity diffusion area as recited in independent claim **19**.

Claims **23-26** are allowable over the prior art of record because the prior art of record does not teach or render obvious a method of manufacturing a semiconductor memory device comprises, in combination with all other features, forming lower electrodes on each of the second impurity diffusion areas as recited in independent claim **23**.

Claims **27-29** are allowable over the prior art of record because the prior art of record does not teach or render obvious a semiconductor memory device comprises, in combination with all other features, a first lower electrode provided on the second impurity diffusion area, and a second lower electrode provided on the third impurity diffusion area as recited in independent claim **27**.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andy Huynh whose telephone number is (571) 272-1781. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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02/02/05



Andy Huynh

Patent Examiner